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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/924,004	08/07/2001	Alexander S. Perel	00-SM6-262	1920

7590

09/11/2003

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EXAMINER

NGUYEN, LAM S

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 09/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/924,004

Applicant(s)

PEREL ET AL.

Examiner

LAM S NGUYEN

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3,4,6-8,11,12 and 14-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3,4,6-8,11,12 and 14-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other:

### DETAILED ACTION

The indicated allowability of claims 4, 5, 12, 13 is withdrawn in view of the newly discovered reference(s) to Inada et al. (US 3953528). Rejections based on the newly cited reference(s) follow.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 3-4, 6-8, 11-12, 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horsky (US 6107634) in view of Foad (US 5977552) and Inada et al. (US 3953528).

Horsky discloses an ion source (FIG. 2, element 58) for an ion implanter, comprising:

a sublimator (FIG. 2, element 52) having a cavity (FIG. 2, element 66) for receiving a source material (FIG. 2, element 68) to be sublimated and for sublimating the source material;

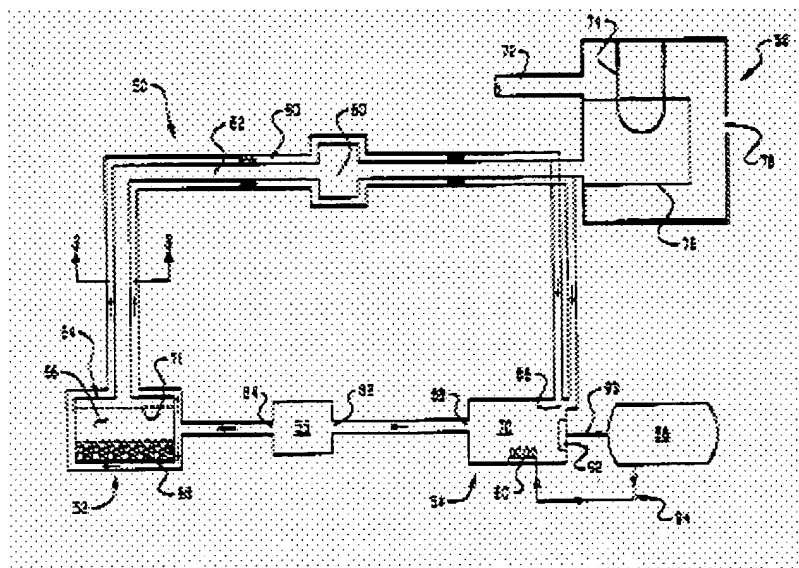
an ionization chamber (FIG. 2, element 58) for ionizing the sublimated source material, said ionization chamber located remotely from said sublimator (FIG. 2); and

a feed tube (FIG. 2, element 62) for connecting said sublimator (FIG. 2, element 52) to said ionization chamber (FIG. 2, element 58).

a heating medium (FIG. 2, element 70) for heating at least a portion of said sublimator (FIG. 2, element 52) and said feed tube (FIG. 2, element 62), and a control mechanism for controlling the temperature of said heating medium (FIG. 2, element 70).

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**Referring to claims 3, 11:** wherein said control mechanism comprises a heating element (FIG. 2, element 80) for heating the heating medium (FIG. 2, element 70), a pump (FIG. 2,



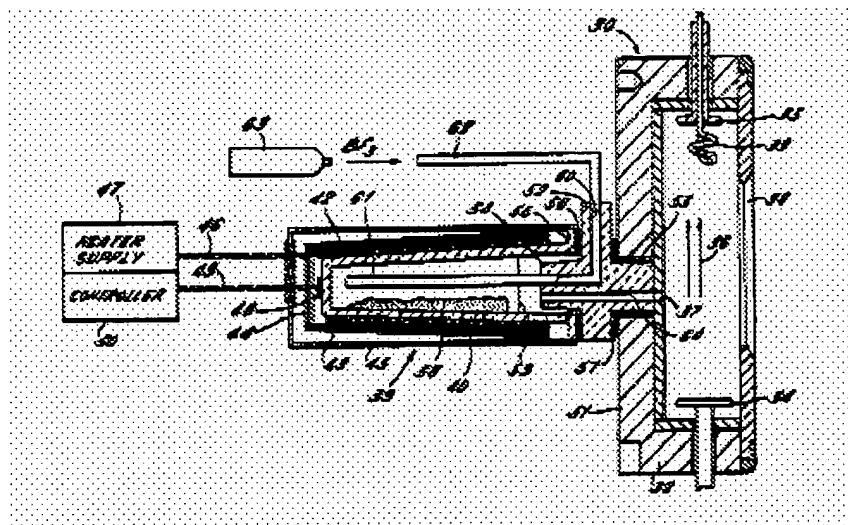
element 55) for circulating said heating medium, at least one thermocouple (FIG. 2, element 92) for providing temperature feedback from said heating medium (FIG. 2, element 70), and a controller (FIG. 2, element 56) responsive to said temperature feedback to output a first control signal (FIG. 2, element 94) to said heating element.

**Referring to claims 6, 14:** wherein said source material is a molecular solid having a vapor pressure of between  $10\exp(-2)$  Torr and  $10\exp(3)$  Torr and a sublimation temperature of between  $20^{\circ}\text{C}$  and  $150^{\circ}\text{C}$  (column 3, line 64 to column 4, line 4).

**Referring to claims 7, 15:** wherein said source material is decaborane (Column 3, line 65).

Horsky does not disclose the comprising of a gas injector for injecting gas into said cavity.

However, Foad discloses an ion source for ion implantation apparatus that comprises a gas injector (FIG. 2, element 61) for injecting gas into a cavity of a crucible (FIG. 2, element 40).



Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to include the gas injector for injecting gas as disclosed by Foad into the cavity of the crucible disclosed by Horsky. The motivation of doing so is to achieve higher proportion of ions extracted from the arc chamber in order to gain the beam current implanted on the target substrate as taught by Foad (column 8, line 10-16).

Also, Horsky does not disclose wherein the injected gas is selected from the group of helium and hydrogen (**Referring claim 4, 12**), wherein said gas improves the heat transferability between walls (64) of the sublimator (52) and the source material (68) (**Referring claims 8, 16**).

Inada et al. disclose a process in a sublimator (element 12) wherein an injected gas selected from the group of helium and hydrogen to improve the heat transferability in the sublimator (column 2, line 29-35).

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Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the ion source disclosed by Horsky such that including a gas selected from the group of helium and hydrogen injected into the sublimator as disclosed by Inada et al. The motivation of doing so is to improve heat transfer in the apparatus and to smoothly transport the sublimed vapor as taught by Inada et al. (column 2, line 29-31).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (703)305-3342. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D. MEIER can be reached on (703)308-4896. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3431 for regular communications and (703)305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

LN

August 25, 2003

  
**Stephen D. Meier**  
**Primary Examiner**